

PCT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
 United States Patent and Trademark
 Office
 Box PCT
 Washington, D.C. 20231
 ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 26 June 2000 (26.06.00)	
International application No. PCT/FI99/00939	Applicant's or agent's file reference PCT116/365
International filing date (day/month/year) 12 November 1999 (12.11.99)	Priority date (day/month/year) 16 November 1998 (16.11.98)
Applicant JUVAKKA, Tuomo et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

24 May 2000 (24.05.00)

☐ in a notice effecting later election filed with the International Bureau on:2. The election ☒ was☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Claudio Borton Telephone No.: (41-22) 338.83.38
--	--

PCT INTERNATIONAL COOPERATION TREATY

PCT

NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

KESPAT OY
P.O.Box 601
FIN-40101 Jyväskylä
FINLANDE

Date of mailing (day/month/year) 14 February 2001 (14.02.01)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference PCT116/365	
International application No. PCT/FI99/00939	International filing date (day/month/year) 12 November 1999 (12.11.99)

1. The following indications appeared on record concerning:		
<input checked="" type="checkbox"/> the applicant	<input type="checkbox"/> the inventor	<input type="checkbox"/> the agent <input type="checkbox"/> the common representative
Name and Address VALMET CORPORATION Fabianinkatu 9 A FIN-00130 Helsinki Finland	State of Nationality FI	State of Residence FI
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	
2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:		
<input type="checkbox"/> the person	<input checked="" type="checkbox"/> the name	<input type="checkbox"/> the address <input type="checkbox"/> the nationality <input type="checkbox"/> the residence
Name and Address METSO PAPER, INC. Fabianinkatu 9 A FIN-00130 Helsinki Finland	State of Nationality FI	State of Residence FI
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	
3. Further observations, if necessary:		
4. A copy of this notification has been sent to:		
<input checked="" type="checkbox"/> the receiving Office	<input type="checkbox"/> the designated Offices concerned	
<input type="checkbox"/> the International Searching Authority	<input checked="" type="checkbox"/> the elected Offices concerned	
<input checked="" type="checkbox"/> the International Preliminary Examining Authority	<input type="checkbox"/> other:	

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Marie-José Devillard
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/FI99/00939	International filing date (day/month/year) 12.11.1999	Priority date (day/month/year) 16.11.1998
International Patent Classification (IPC) or national classification and IPC D 21 G 3/00 // D 21 F 3/10		
Applicant Metso Paper Inc. et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.
☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 1 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 24.05.2000	Date of completion of this report 07.03.2001
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. 08-667 72 88	Authorized officer Jan Carlerud/ELY Telephone No. 08-782 25 00

I. Basis of the report**1. With regard to the elements of the international application:***

- ☐ the international application as originally filed
- ☒ the description:
pages 1-5 , as originally filed
pages _____ , filed with the demand
pages _____ , filed with the letter of _____
- ☒ the claims:
pages _____ , as originally filed
pages _____ , as amended (together with any statement) under article 19
pages _____ , filed with the demand
pages 6 , filed with the letter of 12.12.2000
- ☒ the drawings:
pages 1-2 , as originally filed
pages _____ , filed with the demand
pages _____ , filed with the letter of _____
- ☐ the sequence listing part of the description:
pages _____ , as originally filed
pages _____ , filed with the demand
pages _____ , filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheet/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2 (c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/FI99/00939

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims	<u>1-4</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-4</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-4</u>	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

This report is based on the claims filed on 12 December 2000.

The claimed invention relates to a doctor for a suction roll including a doctor slat and its holder and, in the direction of rotation of the suction roll, there is also a doctor blade with a blade holder fitted to the doctor after the doctor slat. The angle between the lines of contact of the doctor slat and the doctor blade is 15-70°; the sides of the angle diverge from a common point located at the rotation axis of the suction roll.

The purpose of the invention is to remove water from the suction roll with the doctor. The doctor blade is arranged to remove the water lifted off the suction roll by the doctor slat.

The following documents are cited in the International Search Report:

D1: US 3198693
D2: US 5178731
D3: WO 9827279
D4: EP 0117670
D5: US 5021124

Document D1 discloses a roll with a device for removing water. First there is a wiper, which is considered to be equivalent to a doctor slat, followed in the direction of rotation of the suction roll by a doctor blade. The doctor blade is arranged to remove the water that is lifted off the roll by the wiper, or doctor slat.

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/FI99/00939

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: V.

The claimed invention according to the new, amended claims differs from D1 in that the doctor blade is related to the doctor slat with fixed relations, in terms of angle, within a doctor assembly. Even though doctor assemblies carrying two doctor blades are known, see for example D3-D5, the internal relation is not defined. Also, none of the documents D3-D5 shows how water is removed from a suction roll. Therefore, the invention according to the amended claims 1-4 is considered to involve an inventive step.

Document D2 shows how a doctor removes water from a suction roll.

Document D3, D4 and D5 show different doctor assemblies that carry two successive doctor blades.

The invention according to claim 1-4 is novel and is considered to involve an inventive step in view of the above reasoning. The criterion of industrial applicability is fulfilled.



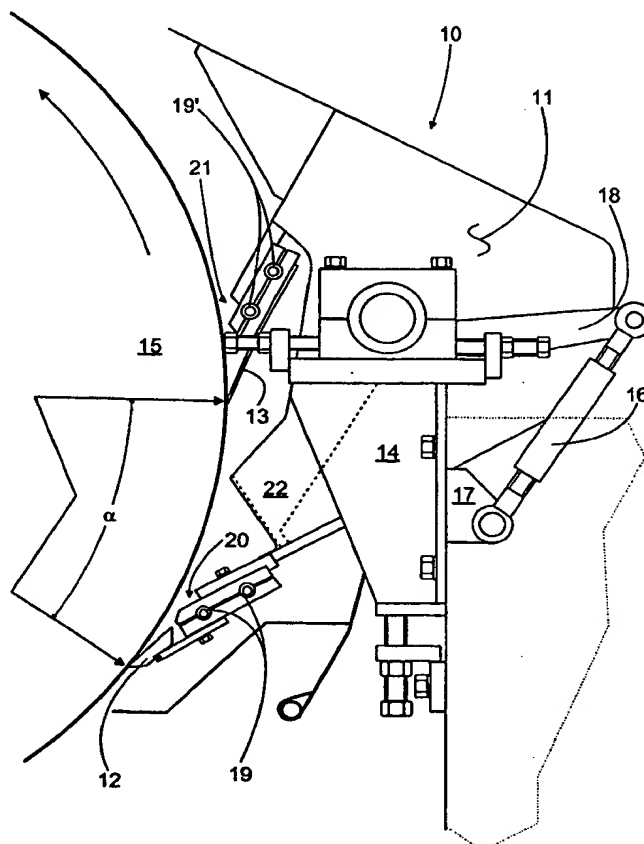
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁷ : D21G 3/00 // D21F 3/10		A1	(11) International Publication Number: WO 00/29669
			(43) International Publication Date: 25 May 2000 (25.05.00)
(21) International Application Number: PCT/FI99/00939 (22) International Filing Date: 12 November 1999 (12.11.99) (30) Priority Data: U980495 16 November 1998 (16.11.98) FI (71) Applicant (for all designated States except US): VALMET CORPORATION [FI/FI]; Fabianinkatu 9 A, FIN-00130 Helsinki (FI). (72) Inventors; and (75) Inventors/Applicants (for US only): JUVAKKA, Tuomo [FI/FI]; Haapasaarentie 2 H, FIN-40820 Haapaniemi (FI). PUSSINEN, Jouko [FI/FI]; Ravimiehentie 10 as 1, FIN-46800 Anjalankoski (FI). (74) Agent: KESPAT OY; P.O.Box 601, FIN-40101 Jyväskylä (FI).			(81) Designated States: AE, AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), DM, EE, EE (Utility model), ES, FI, FI (Utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i> <i>In English translation (filed in Finnish).</i>

(54) Title: DOCTOR FOR A SUCTION ROLL PARTICULARLY IN PAPER MACHINES

(57) Abstract

The invention relates to a doctor for a suction roll particularly in a paper machine, which doctor (10) is intended to remove water from a suction roll (15). The doctor (10) includes a doctor slat (12) fitted against the surface of suction roll (15) to extend essentially over the entire width of suction roll (15), as well as the doctor slat's (12) holder (20) and loading devices (19). In the direction of rotation of the suction roll (15), there is a doctor blade (13), which is as such known, with a blade holder (21) fitted to doctor (10) after doctor slat (12). Doctor blade (13) is arranged to remove the water lifted off suction roll (15) by doctor slat (12).



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
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AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
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DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

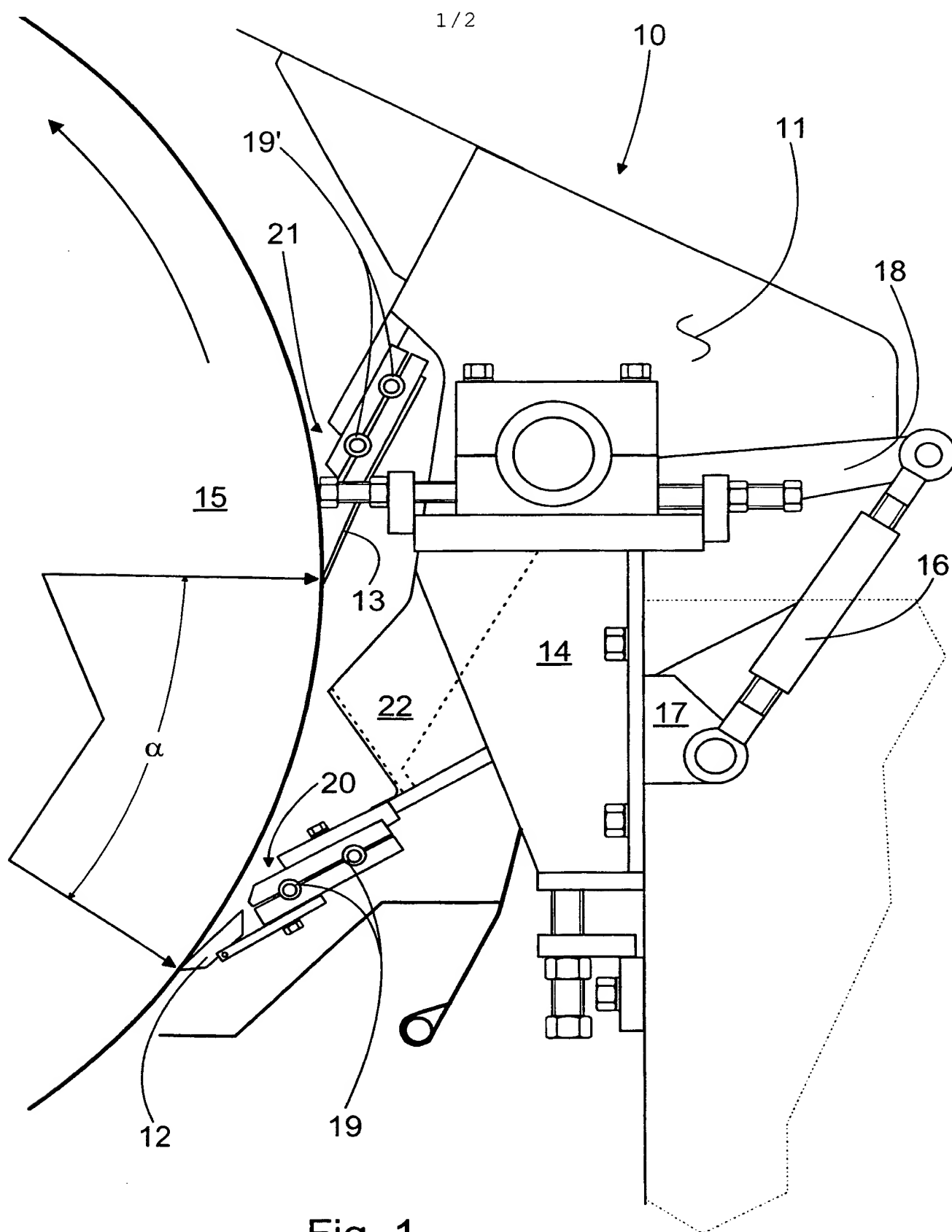


Fig. 1

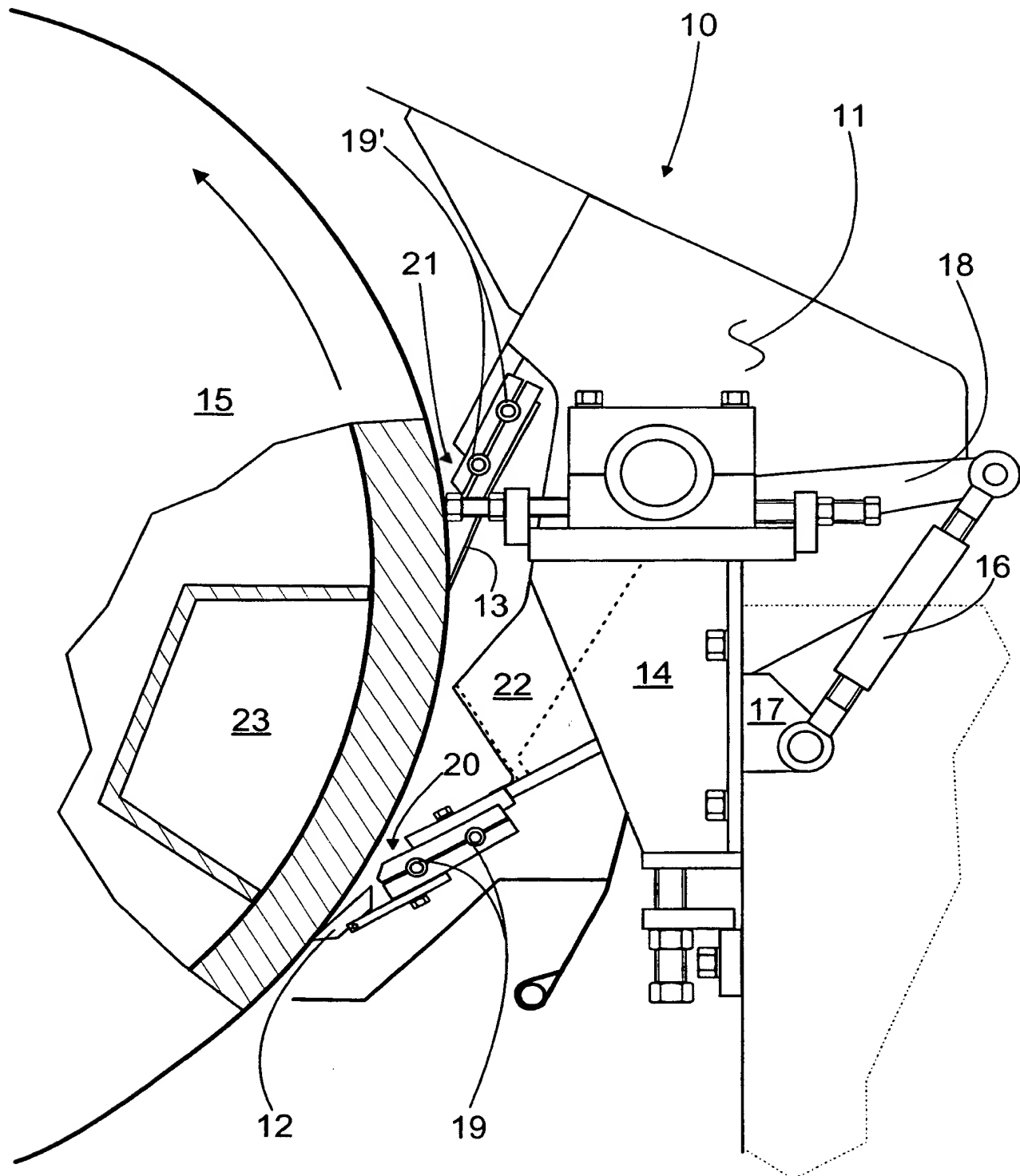


Fig. 2

INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 99/00939

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: D21G 3/00 // D21F 3/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: D21G, B41F, D21F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3198693 A (E.J. JUSTUS), 3 August 1965 (03.08.65), column 1, line 20 - line 23; column 1, line 64 - line 70; column 7, line 64 - column 8, line 28, figure 6 --	1-5
A	US 5178731 A (JUHA KIVIMAA ET AL), 12 January 1993 (12.01.93) --	1-5
A	WO 9827279 A1 (VALMET CORPORATION), 25 June 1998 (25.06.98) --	1-5
A	EP 0117670 A2 (BELOIT WALMSLEY LIMITED), 5 Sept 1984 (05.09.84) --	1-5

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"I" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

4 April 2000

Date of mailing of the international search report

10 -04- 2000

Name and mailing address of the ISA/

Swedish Patent Office

Box 5055, S-102 42 STOCKHOLM

Facsimile No. +46 8 666 02 86

Authorized officer

Helena Hemphälä/ELY

Telephone No. +46 8 782 25 00

INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 99/00939

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5021124 A (PEKKA TURTINEN ET AL), 4 June 1991 (04.06.91) -- -----	1-5

INTERNATIONAL SEARCH REPORT

Information on patent family members

02/12/99

International application No.

PCT/FI 99/00939

Patent document cited in search report			Publication date	Patent family member(s)	Publication date
US	3198693	A	03/08/65	NONE	
US	5178731	A	12/01/93	AT 129304 T CA 2043842 C DE 69113870 D,T EP 0462090 A,B SE 0462090 T3 FI 87095 B,C FI 902910 A	15/11/95 13/06/95 04/04/96 18/12/91 14/08/92 12/12/91
WO	9827279	A1	25/06/98	GB 9626130 D	00/00/00
EP	0117670	A2	05/09/84	FI 840598 A JP 59156456 A ZA 8401040 A	25/08/84 05/09/84 26/09/84
US	5021124	A	04/06/91	CA 2009311 A,C CN 1045141 A FI 83347 B,C FI 890733 A	15/08/90 05/09/90 15/03/91 16/08/90

REC'D 16 MAR 2001

WIPO PCT

Applicant's or agent's file reference	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/FI99/00939	International filing date (day/month/year) 12.11.1999	Priority date (day/month/year) 16.11.1998
International Patent Classification (IPC) or national classification and IPC ⁷ D 21 G 3/00 // D 21 F 3/10		
Applicant Metso Paper Inc. et al		

- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 4 sheets, including this cover sheet.
☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 1 sheets.

- This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 24.05.2000	Date of completion of this report 07.03.2001
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. 08-667 72 88	Authorized officer Jan Carlerud/ELY Telephone No. 08-782 25 00

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/FI99/00939

I. Basis of the report

1. With regard to the **elements** of the international application:*☐ the international application as originally filed☒ the description:pages 1-5, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

☒ the claims:

pages _____, as originally filed

pages _____, as amended (together with any statement) under article 19

pages _____, filed with the demand

pages 6, filed with the letter of 12.12.2000☒ the drawings:pages 1-2, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

☐ the sequence listing part of the description:

pages _____, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).☐ the language of publication of the international application (under Rule 48.3(b)).☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:☐ contained in the international application in written form.☐ filed together with the international application in computer readable form.☐ furnished subsequently to this Authority in written form.☐ furnished subsequently to this Authority in computer readable form.☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.4. ☐ The amendments have resulted in the cancellation of:☐ the description, pages _____☐ the claims, Nos. _____☐ the drawings, sheet/fig _____5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2 (c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/FI99/00939

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>1-4</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-4</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-4</u>	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

This report is based on the claims filed on 12 December 2000.

The claimed invention relates to a doctor for a suction roll including a doctor slat and its holder and, in the direction of rotation of the suction roll, there is also a doctor blade with a blade holder fitted to the doctor after the doctor slat. The angle between the lines of contact of the doctor slat and the doctor blade is 15-70°; the sides of the angle diverge from a common point located at the rotation axis of the suction roll.

The purpose of the invention is to remove water from the suction roll with the doctor. The doctor blade is arranged to remove the water lifted off the suction roll by the doctor slat.

The following documents are cited in the International Search Report:

D1: US 3198693

D2: US 5178731

D3: WO 9827279

D4: EP 0117670

D5: US 5021124

Document D1 discloses a roll with a device for removing water. First there is a wiper, which is considered to be equivalent to a doctor slat, followed in the direction of rotation of the suction roll by a doctor blade. The doctor blade is arranged to remove the water that is lifted off the roll by the wiper, or doctor slat.

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/FI99/00939

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: V.

The claimed invention according to the new, amended claims differs from D1 in that the doctor blade is related to the doctor slat with fixed relations, in terms of angle, within a doctor assembly. Even though doctor assemblies carrying two doctor blades are known, see for example D3-D5, the internal relation is not defined. Also, none of the documents D3-D5 shows how water is removed from a suction roll. Therefore, the invention according to the amended claims 1-4 is considered to involve an inventive step.

Document D2 shows how a doctor removes water from a suction roll.

Document D3, D4 and D5 show different doctor assemblies that carry two successive doctor blades.

The invention according to claim 1-4 is novel and is considered to involve an inventive step in view of the above reasoning. The criterion of industrial applicability is fulfilled.

RECORD COPY

PCT REQUEST

1/4

Original (for SUBMISSION) - printed on 11.11.1999 10:45:20 AM

PCT116/365

0	For receiving Office use only	
0-1	International Application No.	PCT/FI 99 / 0 0 9 3 9
0-2	International Filing Date	12 NOV 1999 (12.11.99)
0-3	Name of receiving Office and "PCT International Application"	The Finnish Patent Office PCT International Application
0-4	Form - PCT/RO/101 PCT Request	
0-4-1	Prepared using	PCT-EASY Version 2.90 (updated 15.10.1999)
0-5	Petition The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty	
0-6	Receiving Office (specified by the applicant)	National Board of Patents and Registration (Finland) (RO/FI)
0-7	Applicant's or agent's file reference	PCT116/365
I	Title of invention	DOCTOR FOR A SUCTION ROLL PARTICULARLY IN PAPER MACHINES
II	Applicant	
II-1	This person is:	applicant only
II-2	Applicant for	all designated States except US
II-4	Name	VALMET CORPORATION
II-5	Address:	Fabianinkatu 9 A FIN-00130 HELSINKI Finland
II-6	State of nationality	FI
II-7	State of residence	FI
III-1	Applicant and/or inventor	
III-1-1	This person is:	applicant and inventor
III-1-2	Applicant for	US only
III-1-4	Name (LAST, First)	JUVAKKA, Tuomo
III-1-5	Address:	Haapasaarentie 2 H FIN-40820 HAAPANIEMI Finland
III-1-6	State of nationality	FI
III-1-7	State of residence	FI

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III-2	Applicant and/or inventor	
III-2-1	This person is:	applicant and inventor
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IV-1	Agent or common representative; or address for correspondence The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:	agent
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V	Designation of States	
V-1	Regional Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	AP: GH GM KE LS MW SD SL SZ TZ UG ZW and any other State which is a Contracting State of the Harare Protocol and of the PCT EA: AM AZ BY KG KZ MD RU TJ TM and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT EP: AT BE CH&LI CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE and any other State which is a Contracting State of the European Patent Convention and of the PCT OA: BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG and any other State which is a member State of OAPI and a Contracting State of the PCT

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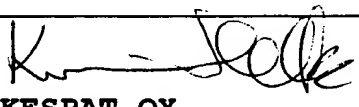
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V-2	National Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	AE AL AM AT (patent and utility model) AU AZ BA BB BG BR BY CA CH&LI CN CR CU CZ (patent and utility model) DE (patent and utility model) DK (patent and utility model) DM EE (patent and utility model) ES FI (patent and utility model) GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK (patent and utility model) SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW	
V-5	Precautionary Designation Statement In addition to the designations made under items V-1, V-2 and V-3, the applicant also makes under Rule 4.9(b) all designations which would be permitted under the PCT except any designation(s) of the State(s) indicated under item V-6 below. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit.		
V-6	Exclusion(s) from precautionary designations	NONE	
VI-1	Priority claim of earlier national application		
VI-1-1	Filing date	16 November 1998 (16.11.1998)	
VI-1-2	Number	U980495	
VI-1-3	Country	FI	
VI-2	Priority document request The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) identified above as item(s):	VI-1	
VII-1	International Searching Authority Chosen	Swedish Patent Office (ISA/SE)	
VIII	Check list	number of sheets	electronic file(s) attached
VIII-1	Request	4	-
VIII-2	Description	5	-
VIII-3	Claims	1	-
VIII-4	Abstract	1	pct116.txt
VIII-5	Drawings	2	-
VIII-7	TOTAL	13	

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	Accompanying items	paper document(s) attached	electronic file(s) attached
VIII-8	Fee calculation sheet	✓	-
VIII-9	Separate signed power of attorney		-
VIII-16	PCT-EASY diskette	-	diskette
VIII-17	Other (specified):	Copy of Search Report of FI U980495	-
VIII-18	Figure of the drawings which should accompany the abstract	1	
VIII-19	Language of filing of the international application	Finnish	
IX-1	Signature of applicant or agent		
IX-1-1	Name	KESPAT OY	
IX-1-2	Name of signatory	Kimmo Helke	
IX-1-3	Capacity	Agent	

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10-1	Date of actual receipt of the purported international application	12 NOV 1999	(12 -11- 1999)
10-2	Drawings:		
10-2-1	Received		
10-2-2	Not received		
10-3	Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application		
10-4	Date of timely receipt of the required corrections under PCT Article 11(2)		
10-5	International Searching Authority	ISA/SE	
10-6	Transmittal of search copy delayed until search fee is paid		

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11-1	Date of receipt of the record copy by the International Bureau	06 DECEMBER 1999	(06.12.99)
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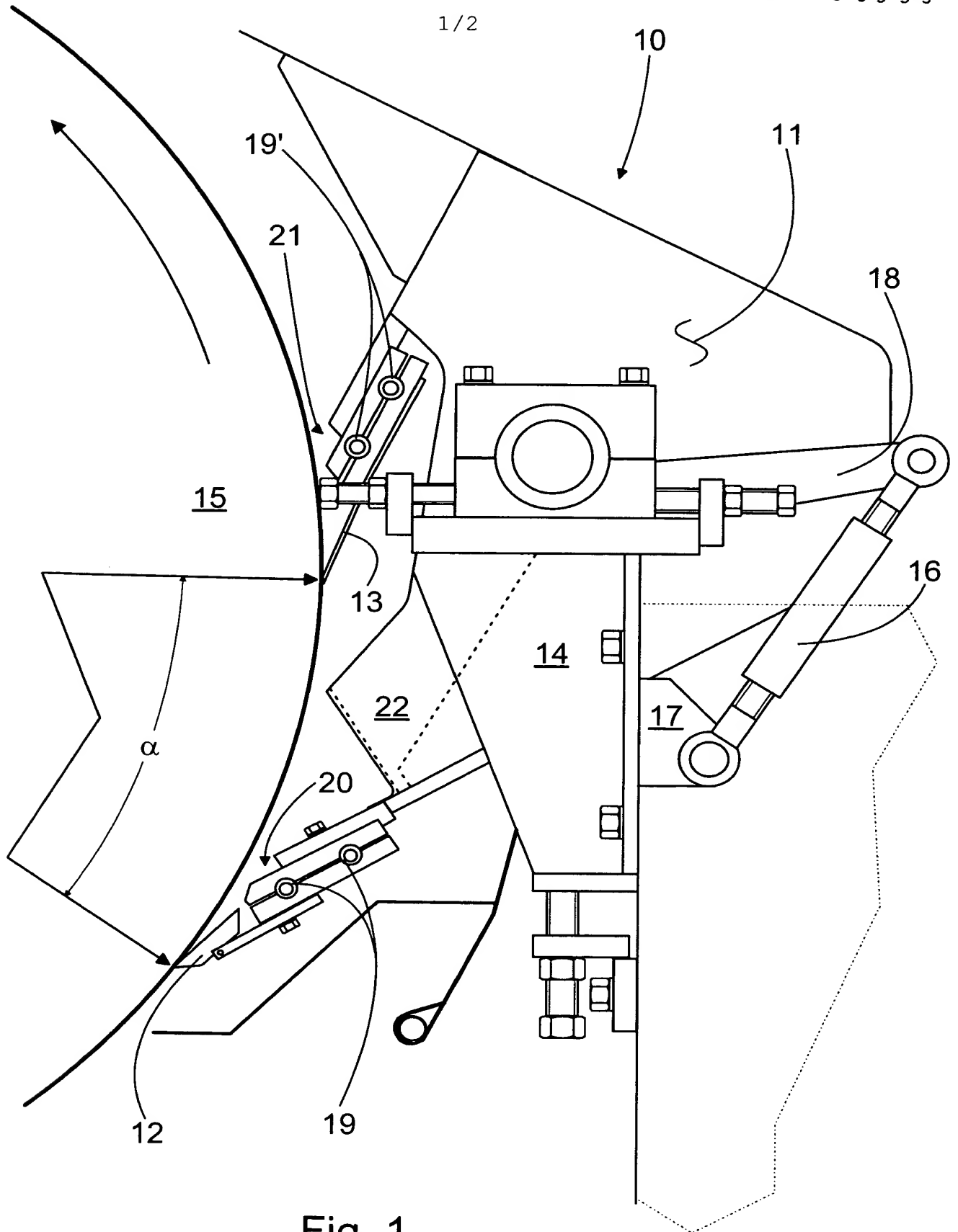


Fig. 1

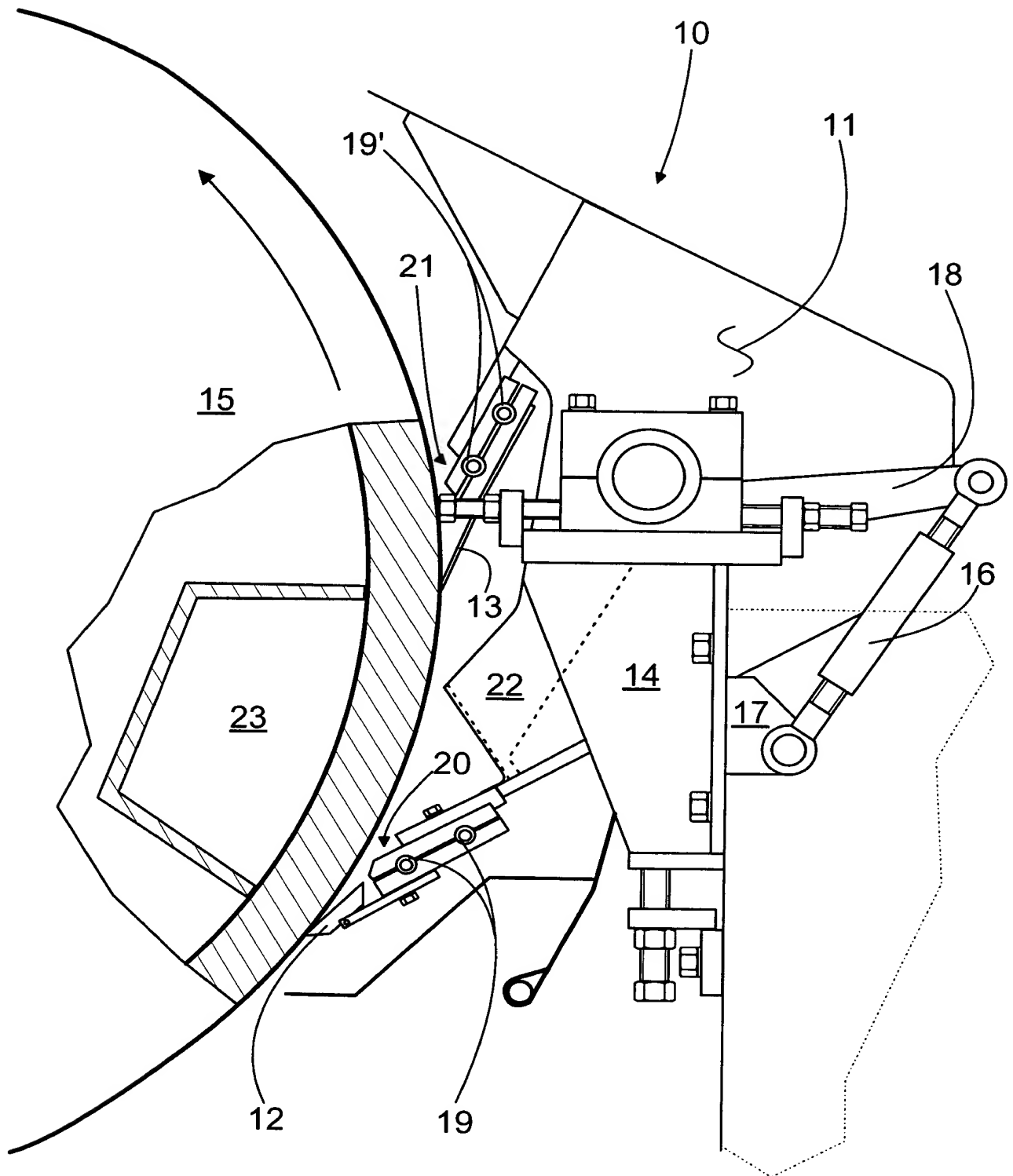


Fig. 2

IMUTELAN KAAVIN ERITYISESTI PAPERIKONEISIIN

Keksinnön kohteena on imutelan kaavin erityisesti paperikoneisiin, joka kaavin on tarkoitettu veden poistamiseksi imutelalta ja johon kaapimeen kuuluu imutelan pintaa vasten sovitettu oleellisesti koko imutelan pituudelle ulottuva kaavinlista sekä sen pidin ja kuormituselimet.

FI-patenttihakemuksesta numero 902910 tunnetaan imutelan kaavin, jolla poistetaan imutelalta vettä. Kaapimessa käytetään teränä kaavinlistaa, joka kaapii imutelan pinnalta vesikalvon pois. Kaavinlista lisäksi aikaansaa jälkeensä imun, joka poistaa myös imutelan porauksista ja urista sinne jäänyttä vettä. Osa imun nostamasta vedestä valuu imutelan alapuoliseen poistoaltaaseen, mutta osa kosteudesta kulkeutuu imutelan pyörimisliikkeen johdosta takaisin huovalle tai vastaavaan. Tämä aiheuttaa viiran tai huovan vetistymistä tai ainakin epätasaisuutta viiran, huovan tai paperin kosteusprofiiliin.

Vastaavaan käyttöön on valmistettu myös kaksoiskaavin, jossa olevilla kahdella kaavinterällä on pyritty parantamaan kaapimen vedenpoistokykyä. Tavanomaisilla kaavinterillä ei kuitenkaan saavuteta kaavinlistan mukaista imuvaikutusta, joka vetäisi veden pois myös imutelan rei'istä. Lisäksi kaavinterät toimivat halutulla tavalla vain tietyllä imutelan kehänopeusalueella. Tällöin paperikoneen nopeutta kasvatettaessa kyseisen kaapimen vedenpoistokyky ja kaavintulos heikkenevät oleellisesti.

Keksinnön tarkoituksena on aikaansaada erityisesti paperikoneisiin uudenlainen imutelan kaavin, jolla vesi saadaan poistettua entistä tehokkaammin imutelalta. Tämän keksinnön tunnusomaiset piirteet ilmenevät oheisista patenttivaatimuksista. Keksinnön mukaisella kaapimen yhdistelmärakenteella saadaan kaapimen edulliset ominaisuudet esille, mikä käytännössä tarkoittaa erittäin hyvää kaavintatulosta. Samalla saavutetaan merkittävä

kuiva-aineen nousu. Veden lisäksi kaapimella myös poistetaan
kuituja ja täyteaineita imutelan rei'istä. Tämä vähentää imute-
lan mukana pyörivän irtomateriaalin määrää ja parantaa samalla
imutelan reikien puhtaana pysyvyyttä. Kaavin myös tasaa imute-
5 lan ympäristön kosteutta, koska suurin osa vedestä saadaan
hallitusti talteen. Tällöin viira, huopa tai vastaava ei vety,
vaan sen kosteusprofiili pysyy tasaisena. Keksinnön mukaista
kaavinta voidaan käyttää kaikissa imutelapositioneissa. Lisäksi
kaavin soveltuu pienin muutoksin hyvin laajalle imutelan ke-
10 hänopeusalueelle.

Keksintöä kuvataan seuraavassa yksityiskohtaisesti viittaamalla
oheisiin eräitä keksinnön sovelluksia kuvaaviin piirroksiin,
joissa

15

Kuva 1 esittää keksinnön mukaisen kaapimen sivulta katsottu-
na,

Kuva 2 esittää keksinnön mukaisen kaapimen sivulta katsottuna
osana imutelan yhteyteen järjestettyä sovitelmaa veden
20 poistamiseksi.

Kuvassa 1 esitetyssä keksinnön mukaisessa kaapimessa 10 on
kaksi terää 12 ja 13, jotka on sovitettu kaapimen 10 runkora-
kenteeseen 11. Runkorakenne 11 on kompakti ja se on laakeroitu
25 molemmista päistään säädettävien tukien 14 välityksellä paperi-
koneen runkoon. Runkoa on kuvattu pistekatkoviivalla. Tarvitta-
essa kaavin 10 voidaan kääntää irti imutelan 15 pinnasta vant-
tiruuvilla 16 tai vastaavalla. Kuvassa 1 vanttiruuvi 16 on
sovitettu kiinteään korvakkeen 17 ja kääntyvään runkorakentee-
30 seen 11 kiinnitetyn tukivarren 18 väliin. Kuitenkin vanttiruuv-
ia 16 käytetään lähinnä vain kaapimen 10 asennon säätämiseen.
Terät 12 ja 13 kuormitetaan ja vapautetaan tavanomaisin kuormi-
tusletkuin 19 ja 19' varustettujen pitimien 20 ja 21 avulla.

35 Kuvan 1 toiminta-asentoisessa kaapimessa 10 terät 12 ja 13
vastaavat imutelan 15 pintaan varsinaisen imusektorin ollessa

- imutelan 15 vastakkaisella puolella. Imutela 15 pyörii nuolen osittamaan suuntaan eikä imutelan 15 reikiä tai uria ole kuvattu. Imutelan 15 pyörimissuunnassa ensimmäisen terän 12 poistama vesi kerätään imutelan 15 alapuoliseen poistoaltaaseen. Toisen 5 terän 13 keräämä vesi ohjataan runkorakenteeseen 11 muodostettuun kaukaloon 22, jolloin se ei haittaa ensimmäisen terän 12 toimintaa. Kaukalosta 22 vesi ohjataan edelleen imutelan 15 alapuolelle poistoaltaaseen.
- 10 Keksinnön mukaisesti imutelan 15 pyörimissuunnassa ensimmäisen terän 12, joka tässä on kaavinlista, jälkeen on kaapimeen 10 sovitettu sinällään tunnettu kaavinterä 13. Esimerkissä kaavinterään 13 kuuluu lisäksi tavanomainen teräpidin 21 ja kuormitusletkut 19'. Tällä teräyhdistelmällä saavutetaan aikaisempaa 15 parempi kaavintatulos varsinkin imutelan kehänopeuden ollessa riittävän suuri. Käytännössä kaavinlista 12 poistaa ensin vesikalvon imutelan 15 pinnalta ja sitten aikaansaa jälkeensä imuvaikutuksen. Tämä niin sanottu foilliefekti muodostuu aina imutelan pyöriessä, mutta tunnetusti merkittävä imu syntyy 20 vasta imutelan kehänopeuden noustessa tietylle tasolle. Tältä tasolta eteenpäin imuvaikutus useimmiten kasvaa tai pysyy ainakin samana. Foilliefekti imee imutelan rei'istä vettä, jonka kaavinterä 13 sitten poistaa kaukaloon 22. Veden mukana rei'istä nousee myös kuituja ja sideaineita, jotka kaavinterä 25 13 poistaa. Keksinnön mukainen kaavin on niin tehokas, että ylimääräistä kosteutta ei kierrä imutelan mukana. Tällöin myös imutelan toiminta tehostuu ja viiran tai huovan uudelleenvetäminen on olematonta.
- 30 Sekä kaavinlistan 12 että kaavinterän 13 pitimet 20 ja 21 on kiinnitetty kaapimen 10 runkorakenteeseen 11, jolloin molemmat terät 12 ja 13 voidaan kaapimen 10 asennuksessa säätää samanaisesti. Pitimet 20 ja 21 on lisäksi sovitettu runkorakenteeseen 11 siten, että imutelan 15 kuvitellun pyörähdysakselin 35 suhteen kaavinlistan 12 ja kaavinterän 13 kosketusviivojen välinen kulma α on $15^{\circ} - 70^{\circ}$. Edullisemmin kulma α on $20^{\circ} -$

40°. Tällöin kaavinterä 13 ehtii kaavinlistan 12 nostaman vesikalvon alle eikä vesi ehdi imeytyä takaisen reikiin. Lisäksi lähekkäin asetettujen terien 12 ja 13 ansiosta kaapimen 10 koko pysyy pienenä. Kaavinlista on valmistettu edullisesti 5 muovista.

Kaavinlistan 12 pidin 20 on sovitettu irrotettavasti kiinnitettäväksi kaapimen 10 runkorakenteeseen 11. Lisäksi runkorakenteeseen 11 kuuluu kaavinlistan 12 pitimen 20 läheisyydessä 10 kaavinterän 13 teräpidintä 21 vastaavat kiinnikkeet (ei esitetty). Näin ollen samaa kaavinta voidaan käyttää myös hitaiksi luokitelluissa paperikoneissa. Tällöin on perusteltua asentaa keksinnön mukainen kaavin varustettuna tavanomaisin kaavinterin paperikoneeseen, vaikka paperikone onkin niin sanotusti hidas. 15 Siten tulevaisuuden nopeuden korotusprojekteissa kaavin voidaan helposti uudistaa yksinkertaisesti vaihtamalla ensimmäisenä teränä olleen tavallisen kaavinterän tilalle kaavinlista. Vaihdon perusteena oleva rajanopeus määritetään tapauskohtaisesti. Periaatteessa kaavinlistan imuvaikutus on merkittävä 20 imutelan kehänopeuden ollessa riittävän suuri.

Imutelan toiminnan edelleen parantamiseksi on edullista järjestää keksinnön mukainen kaavin osaksi sovitelmaa, joka esitetään kuvassa 2. Toiminnallisista osista käytetään samoja viitenumeroita. 25 Kuvan 2 mukaisesti sovitelmaan kuuluu ylipainekammio 23, joka asetetaan imutelan 15 sisään kaapimen 10 kohdalle. Edullisesti ylipainekammio 23 sijaitsee terien 12 ja 13 välissä, pyörimissuunnassa heti ensimmäisen terän 12 jälkeen. Tällöin kaavinlistan 12 muodostaman alipaineen vettä poistava vaikutus 30 vahvistuu rei'istä purkautuvalla ylipainella. Ylipainekammio 23 päättyy ennen toista terää, jotta kaavinterän 13 toiminta ei häiriintyisi ilmavirrasta. Sovitelmallä imutelan reiät tyhjenevät entistä paremmin.

35 Keksinnön mukainen imutelan kaavin soveltuu siis laajalla imutelan kehänopeusalueella paperikoneen kaikkiin imutelaposi-

tioihin. Erityisesti kaapimen uudistus eri nopeusalueelle on yksinkertaista, mikä vähentää kustannuksia. Käytössä kaapimella saavutetaan merkittävä kuiva-aineen nousu. Lisäksi kaavintatulos on erinomainen. Kaavintatuloksen ollessa hyvä tasaantuu s myös imutelan jälkeinen kosteusprofiilikin, koska kerran viirasta tai huovasta imetty vesi ei palaa enää uudelleen viiralle tai huovalle. Tällöin myös imutelan ympärillä leijuva kosteus harso ohenee.

PATENTTIVAATIMUKSET

1. Imutelan kaavin erityisesti paperikoneisiin, joka kaavin (10) on tarkoitettu veden poistamiseksi imutelta (15) ja johon kaapimeen (10) kuuluu imutelan (15) pintaa vasten sovitettu oleellisesti koko imutelan (15) pituudelle ulottuva kaavinlista (12) sekä sen pidin (20) ja kuormituselimet (19), tunnettu siitä, että imutelan (15) pyörimissuunnassa kaavinlistan (12) jälkeen on kaapimeen (10) sovitettu sinällään tunnettu kaavinterä (13) teräpitimineen (21) sovitettuna poistamaan kaavinlistan (12) nostamaa vettä imutelta (15).

2. Patenttivaatimuksen 1 mukainen kaavin, tunnettu siitä, että imutelan (15) kuvitellun pyörähdysakselin suhteen kaavinlistan (12) ja kaavinterän (13) kosketusviivojen välinen kulma on 15° - 70° , edullisemmin 20° - 40° .

3. Patenttivaatimuksen 1 tai 2 mukainen kaavin, tunnettu siitä, että kaapimessa (10) on runkorakenne (11), johon sekä kaavinlistan (12) että kaavinterän (13) pitimet (20, 21) on sovitettu.

4. Patenttivaatimuksen 3 mukainen kaavin, tunnettu siitä, että kaavinlistan (12) pidin (20) on sovitettu irrotettavasti kiinnitettäväksi runkorakenteeseen (11).

5. Patenttivaatimuksen 3 tai 4 mukainen kaavin, tunnettu siitä, että runkorakenteeseen (11) kuuluu kaavinlistan (12) pitimen (20) läheisyydessä kaavinterän (13) teräpidintä (21) vastaavat kiinnikkeet.

(57) TIIVISTELMÄ

Keksintö koskee imutelan kaavinta erityisesti paperikoneisiin, joka kaavin (10) on tarkoitettu veden poistamiseksi imutelalta (15). Kaapimeen (10) kuuluu imutelan (15) pintaa vasten sovitettu oleellisesti koko imutelan (15) pituudelle ulottuva kaavinlista (12) sekä sen pidin (20) ja kuormituseliimet (19). Imutelan (15) pyörimissuunnassa kaavinlistan (12) jälkeen on lisäksi kaapimeen (10) sovitettu sinällään tunnettu kaavivinterä (13) teräpitimineen (21). Kaavivinterä (13) on sovitettu poistamaan kaavinlistan (12) nostamaa vettä imutelalta (15).